AMENDMENTS TO THE CLAIMS

1. (currently amended) A system for detecting radiation phenomena in an area surrounding a wellbore traversing an earth formation, comprising:
an elongated support member adapted for disposal within said wellbore;
multiple radiation detectors mounted on said support member~~, at least one of the detectors adapted to detect gamma ray related phenomena~~; and
at least one of said radiation detectors being ~~segmented to provide focused sensitivity or adapted~~ disposed within another radiation detector to simultaneously provide multiple types of radiation phenomena measurements.

2. (canceled)

3. (original) The system of claim 1, further comprising a radiation source mounted on said support member.

4. (currently amended) The system of claim 1, wherein the at least one ~~of the~~ radiation detector[[s]] providing multiple types of radiation phenomena measurements is adapted to detect neutron related phenomena.

5. (original) The system of claim 1, wherein said support member is adapted for disposal within said wellbore during or after drilling of said wellbore.

6. (original) The system of claim 3, wherein the radiation source comprises a controllable neutron source adapted to emit selected duration bursts of high-energy neutrons.

7. (original) The system of claim 3, wherein the radiation source comprises an x-ray source.

8. (original) The system of claim 1, further comprising a marker material adapted for disposal within the wellbore or the formation, said material being naturally radioactive or capable of being made radioactive when bombarded with neutrons.

9. (currently amended) The system of claim 1, wherein the at least one ~~segmented~~ detector providing multiple types of radiation phenomena measurements is adapted to provide azimuthal sensitivity about said support member.

10. (currently amended) The system of claim 9, wherein the at least one ~~segmented~~ detector comprises a plurality of scintillation material segments joined together.

11. (currently amended) The system of claim 9, wherein the at least one ~~segmented~~ detector comprises two scintillation material segments joined together having a barrier material disposed between said segments.

12. (currently amended) The system of claim 9, wherein the at least one ~~segmented~~ detector comprises a plurality of scintillation material segments coupled to a multiplier adapted to convert light to electron signals.

13. (currently amended) The system of claim 1, wherein ~~said support member comprises~~ a plurality of said radiation detectors are adapted such that their individual sensitivities are focused about differing orientations relative to said support member.

14. (original) The system of claim 13, wherein said plurality of focused radiation detectors are disposed on said support member such that they provide continuous azimuthal radiation detection about said support member.

15. (original) The system of claim 14, wherein each detector of said plurality of focused radiation detectors comprises a shielded scintillation crystal, each said shield adapted to block the passage of radiation therethrough.

16. (original) The system of claim 15, wherein each detector of said plurality of detectors is positioned axially proximate another one of said detectors along said support member.

17. (original) The system of claim 15, wherein each said scintillation crystal is cylindrically formed.

18. (original) The system of claim 17, wherein each said shield defines an arc of 90 degrees.

19. (currently amended) The system of claim ~~2~~1, wherein the at least one ~~multiple measurement~~ detector providing multiple types of radiation phenomena measurements is adapted to detect thermal or epithermal neutrons.

20. (currently amended) The system of claim ~~2~~1, wherein the at least one ~~multiple measurement~~ detector providing multiple types of radiation phenomena measurements is adapted to detect gamma rays.

21. (currently amended) A method for detecting radiation phenomena in an area surrounding a wellbore traversing an earth formation, comprising:

disposing a support member within said wellbore, said support member having multiple radiation detectors mounted thereon, ~~at least one of the detectors adapted to detect gamma ray related phenomena;~~ at least one of said radiation detectors being ~~segmented to provide focused sensitivity or adapted~~ disposed within another radiation detector to simultaneously provide multiple types of radiation phenomena measurements; and

detecting radiation phenomena with ~~one of~~ said radiation detector[[s]] providing multiple types of radiation phenomena measurements.

22. (canceled)

23. (currently amended) The method of claim 21, wherein the at least one ~~of the~~ detector[[s]] providing multiple types of radiation phenomena measurements is adapted to detect neutron related phenomena.

24. (original) The method of claim 21, wherein said radiation detecting step comprises detecting gamma ray related phenomena.

25. (original) The method of claim 21, wherein said support member comprises a radiation source disposed thereon.

26. (original) The method of claim 25, wherein said radiation source comprises a neutron source.

27. (original) The method of claim 26, further comprising irradiating the formation or wellbore with neutrons from said neutron source.

28. (original) The method of claim 21, wherein said support member is disposed within said wellbore during drilling of said wellbore.

29. (original) The method of claim 21, wherein said support member is disposed within said wellbore after drilling of said wellbore.

30. (original) The method of claim 26, wherein said neutron source is adapted to emit selected duration bursts of high-energy neutrons.

31. (original) The method of claim 21, further comprising disposing a marker material within the wellbore or formation, said material being naturally radioactive or capable of being made radioactive when bombarded with neutrons.

32. (currently amended) The method of claim 21, wherein the at least one ~~segmented~~ detector providing multiple types of radiation phenomena measurements is adapted to provide azimuthal sensitivity about said support member.

33. (currently amended) The method of claim 32, wherein the at least one ~~segmented~~ detector providing multiple types of radiation phenomena measurements comprises a plurality of scintillation material segments joined together.

34. (currently amended) The method of claim 32, wherein the at least one ~~segmented~~ detector providing multiple types of radiation phenomena measurements comprises two scintillation material segments joined together having a barrier material disposed between said segments.

35. (currently amended) The method of claim 32, wherein the at least one ~~segmented~~ detector providing multiple types of radiation phenomena measurements comprises a plurality of scintillation material segments coupled to a multiplier adapted to convert light to electron signals.

36. (currently amended) The method of claim 21, wherein ~~said support member comprises~~ a plurality of said radiation detectors are adapted such that their individual sensitivities are focused about differing orientations relative to said support member.

37. (original) The method of claim 36, wherein said plurality of focused radiation detectors are disposed on said support member such that they provide continuous azimuthal radiation detection about said support member.

38. (original) The method of claim 37, wherein each detector of said plurality of focused radiation detectors comprises a shielded scintillation crystal, each said shield adapted to block the passage of radiation therethrough.

39. (original) The method of claim 38, wherein each detector of said plurality of detectors is positioned axially proximate another one of said detectors along said support member.

40. (original) The method of claim 38, wherein each said scintillation crystal is cylindrically formed.

41. (original) The method of claim 40, wherein each said shield defines an arc of 90 degrees.

42. (currently amended) The method of claim 21, wherein the at least one ~~multiple measurement~~ detector providing multiple types of radiation phenomena measurements is adapted to detect thermal or epithermal neutrons.

43. (currently amended) The method of claim 21, wherein the at least one ~~multiple measurement~~ detector providing multiple types of radiation phenomena measurements is adapted to detect gamma rays.